

## The Visualization of Flow

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### Abstract

*Flow* has been brought to philosophical and popular attention by Mihaly Csikszentmihalyi's book of the same name. However, it is also a critical subject in both the math and art disciplines. In art, movement, visual or real, is a critical element. It is the single most important of the seven Elements of Design in regard to referencing energy. Without movement a work of art can have many masterful qualities and yet still appear lifeless. *Flow* is the catalyst of movement, visual or otherwise. In Math/Physics, *flow* is represented by a variety of systems – Vector, Hamiltonian, Ricci and Geodesic. Each of these *flow* systems has a counterpart in the visual art and design worlds. In design, 2D, 3D or 4D, *flow* lines run through a work of art and create visual pathways for the eye to follow. They operate in a variety of fashions with their own set of mechanics, rules and conditions. This paper will look at art *flow* mechanisms of calligraphy, gesture, alignment, and continuation.

Flow lines are constructed pathways an observer's vision follows through a work of art. Sometimes the lines are explicit, but more often in great art works they are implied or gently contextualized. The stronger the visual pathway, the more organized a work of art will appear to be. Such is not always a virtue since tension, contrast ambiguity and a plethora of other influences must be considered but, in general, flow is a desired value. Flow lines are created predominantly by grouping and aligning edges of forms, lines and points. Since the intention is to increase the visual momentum of a work of art, they enhance the overall curvature of a form when a form is organized to smooth-out irregularities. The variety of utilized forms, edges and lines and the spaces between them lend to the complexity, speed, fluidity, and dynamics of the flow lines and the form. The smoother the lines, the more elegant, graceful and faster they and the work will appear to be. Without flow lines, a work will be disjointed, deformed, chaotic or static.



Edges, which line up directly will create an explicit line or visual pathway. If they are slightly offset, yet still parallel, the eye will follow them. Likewise, if they are close to parallel, the eye will still be guided, but the orchestration will not be as direct. This will often initiate a desirable visual tension and ambiguity and yet still allow for the core flow to persist. Space between edges can be visually bridged, as long as we perceive them as being connected. Generally the proximity of the two lines, or edges, will need to be

quite close for them to have a visual connection. However, in works which objects have greater spatial presence, the proximity can be expanded. If the work of art is in motion the space between the edges can increase proportionally to the speed of the viewer. For instance, two dots twenty feet apart will appear unrelated unless you put them in the center of a road and drive next to them at 60 miles an hour. Then the dots become a unified line and our perception bridges the gap and blends them together as a whole. In this case the visualization parallels the move from Euclidian to non-Euclidian physics.

The visual speed of a line is determined by a variety of factors and conditions. In design, horizontal and vertical lines appear static because it is uncertain about how our notions of gravity will visually effect them. On the other hand, diagonal lines are both quicker and more dynamic because they have a clear perceptual effect of gravity. Secondly, the straighter the line is, the faster it appears. However, there are conditions, which will affect it. Interruptions such as breaks, bumps, sharp divergent angles or even subtle waves will slow down the speed of a line. The more interruptions the slower the line until the interruptions are organized into a pattern. Once they organize into a pattern, like a wave, our brain unifies them and visually we skip over them like a skier over the tops of moguls.

Calligraphy means beauty and writing. It can be used in the service of writing and symbols (China and Japan), in fluid pattern and lines (Islam) or in sensual drawing (Art Nuevo) or any combination there of (Graffiti). Calligraphy is the art of flow lines. More specifically, long uninterrupted sensual flow lines. Either in writing or in drawing, the emphasis is on the fluid motion and the unending grace of the line. The calligraphic quality is the uninterrupted sensual flow. The longer the line is without interruption, the greater the sensual appeal. The emphasis is on flow with marginal attention given to description, content, narrative or even subject. Thus, calligraphic lines are often given over to romance or emotionally saturated (elevated) images.

On the other hand, gesture lines have a similar emphasis on flow, but they differ in intent and energy. Where as calligraphic lines will often follow the fluid exterior lines of a form, gesture lines are energy lines. They represent the energy that runs through a form, be it a human body or a building, and express the energy flow, direction and potential. As such they do not follow the exterior outline of a form but rather pierce through the interior, expressing the most direct pathway which still retains the forms energy and movement. As such, gesture lines lean away from romance and toward expression. Whereas a calligraphic line is primarily concerned with flow as romance and external sensuality, a gesture is a forceful line that portrays the internal potential energy of the figure or object. In gesture drawing the objective is to represent the essential or implied energy of a subject. Since such realities are not explicit, one must look carefully and employ creative visualization to see them.

Alignment is the organization of multiple conditions/elements along a single pathway. The viewer will visually connect shapes, point, spaces and colors that share a common pathway. The grouping of such elements in a manner that prompts visual speed is the process of alignment. The eye and brain collaborate and to bridge some gaps and divergent shapes if, in fact, alignment of the other elements is visually stronger. The measurement, forming and balancing the flow along perceptual lines is the role of the artist. If the shapes are similar, then the alignment is enhanced and vice versa. Calculating the alignment is increasingly difficult with each variable that is included. Continuation is primarily achieved through 'push and pull', a technique by which artists vary the visual weight of a line. This design term refers to line density, which is increased and decreased in order to achieve the desired optimum visual weight. Such lines, which transition from very thick to thin and back again are used to create dramatic tone, emotion, and emphasis. Without it, a line will appear monotonous, static and lifeless.

Flow is energy visualized. Orchestrating flow is the work of both artists and engineers. Similar to calculating viscosity and momentum, being able to channel the appropriate visual flow through an artwork is the difficult yet rewarding design challenges.